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IB Chemistry

The Possibility of Nitrate Accumulation from a Waters Source to its End

Abstract

Because nitrate loading of streams, lakes, and rivers can have an adverse effect on the aquatic and local inhabitants, it is necessary to actively measure and regulate these levels. In order to do this, several different tests are used. The first test was a pH test which measured the acidity of water. This is important because nitrate loading is signified by an excess of H^+ ions in water, leading to a lower pH that causes algae to grow at higher rates. When algae grows at faster rates, there is a possibility of an algae bloom, blocking the sunlight necessary for photosynthesis and creating a swamp like environment. The second test used was a nitrate concentration test, which is very important because it gives the actual nitrate concentration in a sample of water. The third test was a conductivity test, which helps to analyze the ion content in the water, which usually is a determinate of so called "hard water," which is also a signal of high nitrate levels. Lastly, the temperature was taken because nitrate loading happens at higher temperatures, when according to Charles's Law, gases such as Oxygen encompass greater volumes, and then go under nitrification to reduce the already low amount of oxygen necessary for animal life. These tests were taken partially on-site and partially (the more technology-oriented tests such as Nitrate concentration, conductivity, and pH) at the lab via samples.

The conclusion of this lab shows that there is no accumulation of nitrate as it travels down a water route, but rather is directly dependent on the environment surrounding. The hypothesis would have been proven had the last water source, Lake Washington, been a higher concentration than the last, the Sammamish River. However the concentration levels of Lake Washington were less than that of the Sammamish River, showing that the nitrate levels did not accumulate. Furthermore, all tested sites were equally safe from nitrate loading at current testing, showing no abnormal or dangerous levels. The cleanest of all sources was the Issaquah River which had a lower temperature, less turbidity, and lower nitrate level than any of the other sites.